Edited by Irving Leveson

Quantitative Explorations in Drug Abuse Policy

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Introduction

IRVING LEVESON

The 1960s was a period of rapid social and economic change, coupled with spectacular growth in the role of government in dealing with social issues. The demands of public programs and policies created enormous pressures for improved information and analyses. In the field of drug abuse these pressures were compounded by the rapid rise of drug use and the absence of much critical information and analysis. The most elementary steps to develop a data base were just beginning, and many years of effort would be required before the accumulation of knowledge could produce a strong foundation for public policy.

There has been enormous progress in improving knowledge about drug abuse since the mid-1960s. However, as in many fields, research has concentrated on a few questions while others largely are ignored, and even where studies exist there are problems of assimilation. Information is widely dispersed, not always accessible and often not in the most useful form. Many analysts do not have adequate understanding of the ways in which studies might enter into policy development, while at the same time, persons responsible for policy formation often do not have sufficient knowledge of how to use research to help resolve policy issues. A major objective of this volume is to illustrate the formation of linkages which may bridge the gap between research and policy.

The selections deal with problems in the areas of epidemiology and social cost, prevention, deterrence, education, treatment, employment and supportive services. For the most part the studies apply to heroin abuse. This is an outcome of the available state of quantitative research as well as the particular familiarity of the editor with these materials.

The first four chapters consider aspects of the measurement of addiction and its social costs. Rufener, Rachal, and Cruze develop detailed estimates of costs of drug abuse in the criminal justice system, addiction programs, medical care and lost productivity. The costs to society of drug abuse are estimated at between $8.4 and $12.2 billion in Fiscal Year 1975. Differences in methodology and findings from previous studies are examined. An important improvement in the methodology over other studies is that the crime attributed to drug abuse is measured by the additional crime committed by abusers rather than all crime by abusers, some of which might have been committed by the same individuals in the absence of drug abuse.[1] To make this distinction the authors rely on an early version of the study by Coate and Goldman in Chapter 4.

Coate and Goldman develop a model which enables them to estimate the effects of a one-dollar increase in drug expenditures on criminal earnings. The method depends on examining differences among individuals in size of habit. The analysis is carried out for a Phoenix House population of 998 persons in New York City. Coate and Goldman find, according to one estimate, that a dollar greater drug consumption leads to $.18-$.29 in additional earnings from general criminal activity. The remainder is financed by sales of drugs, legal earnings, transfer payments such as Public Assistance and other sources. Rufener, Rachal, and Cruze use a $.30 figure in their calculations. In the absence of additional information they extrapolate this share of drug costs from crime directly to a national population.[2]

Hunt and Chambers (1976) and Dupont and Greene (1973) have supplemented current indicators of drug abuse with historical series constructed from information on persons in treatment in selected cities. Year of first heroin use is determined from a population in treatment at a point in time and the data arranged to represent the number of new heroin abusers in each year. Time series

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[1]Information on the effects of addiction on crime has been rather limited, although some good literature reviews exist. See Goldman and Coate (1977), Greenberg and Adler [n.d.] and Jacoby et al. (1973).

[2]Coate and Goldman also find that the share of drug costs made up of illegal earnings is greater for users of drugs other than heroin than it is for users of heroin. Since drugs other than heroin tend to cost less, this may mean that their debilitating effects were greater than heroin or that their heavy use was associated with less work-oriented life styles. Since the population studied was residing in a therapeutic community this also may reflect the selection of a group for which use of drugs other than heroin was particularly limiting or whose attachment to the labor force was particularly weak.

constructed from year of first use show peak use most typically occurring around 1969.

Several authors have criticized the method which Hunt and others use to infer timing (Richman and Abbey, 1976; Gould in Rittenhouse, 1976). The most important of their grounds for believing that a large bias may occur is that there is a delay between first use and admission to treatment. This delay could in theory cause the lag pattern to be mistaken for a pattern of changes in incidence over time. While Hunt and Chambers (1976, p. 110) make a correction for exclusion of those who have not entered treatment, there is no available series which satisfactorily adjusts for any tendency for the lag distribution to appear as if it is a fluctuation in incidence. The more important question, however, is whether an adjustment is really necessary.

Siguel (Chapter 2) attempts to separate the effects of incidence and lag distribution in data from a population in treatment for the entire United States. He compares population groups which have different lag distributions to determine if they have patterns of incidence with similar timing. There is a peak at about 1969 for groups having different lag distributions. This finding is consistent with the interpretation that the peak reflects the pattern of incidence. (In some cases there is a secondary peak which may be produced by the lag in entry into treatment.)

Siguel's extensive data, much in the form of unpublished tables, offer a still more powerful refutation of the notion that the 1969 peak is an artifact of the lag distribution. Suppose the lag in the earlier analyses of the 1972 admission cohort had produced a 1969 peak as a statistical artifact. If the lag in entry into treatment remained constant, for persons admitted to treatment in 1975, the peak should have occurred three years earlier in 1972. Yet Siguel's charts show that peak incidence in Washington, D.C. continues to be around 1969 for persons admitted to treatment in 1975 and 1976. There is no evidence that a corresponding increase occurred in the lag in entry into treatment. These, and similar findings for New York and other cities, clearly imply that the 1969 data for the peak in year of first heroin use is real.

When the price of heroin rises, drug users do not have as much of an opportunity to adjust legal sources of income in the short run as they would over a longer period of time. While some may reduce size of habit, the number of users would not be expected to decrease to the same degree as if the price of heroin remained high for a long time. Brown and Silverman (Chapter 3) construct a time series of heroin prices adjusted for purity and size of buy on a monthly basis from 1970 to 1972. When the price series is used to estimate the response of crime to fluctuations in heroin price in New York City, they find that a 10 percent increase in price is associated with an increase of 1.4 to 3.6 percent in property crime in various categories. These short-run responses can be translated into an approximate measure of the proportion of crime committed by addicts. They

suggest a magnitude of 14 to 36 percent or approximately 23 percent as an average for all crimes. Leveson (Chapter 5) estimates the proportion at the lower end of this range.

While there is a positive association between crime and the price of heroin for New York, the results for other cities are mixed. In a companion study, Silverman and Spruill (1977) found strong evidence for Detroit as well. The prospect that crime would increase after a rise in the price of heroin following increased enforcement has at times been a deterrent to police action.

Chapters 5 through 7 deal with various aspects of the determinants of the quantity of drug abuse and the number of abusers. Leveson (Chapter 5) examines interstate differences in opiate-use rates in 1961 in a multivariate analysis. The demand analysis found a statistically significant relationship of drug use to race and to poverty, defined as the proportion of families with income below half a state's median income. Median family income had a very strong positive effect on opiate-use rates after controlling for other variables. This suggests that income growth could produce substantial increases in drug use over time.

In Chapter 6, Leveson compares changes over time in indicators of heroin incidence and prevalence with other developments which may explain the variations observed. Exploratory comparisons suggest that changing international supplies have played a dominant role in the changing rates of heroin use. These factors include not only the off-and-on effects of the Turkish opium ban and the growth in supplies from Mexico, but also fluctuations which appear to be associated with the rise and decline of commerce to Southeast Asia in the Vietnam era. The hypothesis that shifts in supply dominated the movements in heroin indicators is supported by comparisons of directions of movement of price and quantity series. The behavior of several socioeconomic variables in the United States is also considered and some speculations offered about their role. Youth unemployment is suggested as a particularly promising subject for further research.

In recent years there has been a substantial accumulation of evidence that the prospects for punishment and the size of the expected penalty exert a strong influence on the amount of criminal behavior in a population. Such findings cannot be applied mechanically in estimating addict responses. The addiction itself may lead to smaller or slower changes. Furthermore, increases in enforcement tend to raise the price of heroin. Addicts may steal more in order to meet the higher prices and this effect may lead to even greater crime. The issue becomes even more complex when it is broken down into questions of enforcement against various drugs, at various levels of the distribution system and through alternative programmatic instruments (see Moore, 1977).

General law enforcement would be expected to have particularly strong effects on addiction if the criminal justice system treated addicts and nonaddicts

unequally. There are indications that in New York City (Manhattan) addicts have higher probabilities of pretrial detention than others (Sajovic, 1975, p. 18-20). This suggests that in addition to general effects the criminal justice system may act much like an involuntary incarceration program.

One use of information on the effects of penalties is in determining the effect of legal status on the social costs of drug use. While legalization would increase the number of drug abusers, it would greatly lower the cost of the drugs and the associated crime per use. The social costs would rise only if the number of users expanded proportionally more than the crime and other social costs per user fell. While reasonable assumptions could be made about the degree to which social costs per user would fall, there is still no acceptable way to gauge the prospective expansion in the number of users.

Leveson (Chapter 5) presents three tests of enforcement effects: 1) A crude test of crossover effects in an interstate analysis finds no relationship between penalties for marijuana possession and use of opiates. 2) Time series analysis suggests a definite negative relationship between drug arrests and narcotic-related deaths over time in New York City prior to the rapid growth of addiction. Thereafter the growth itself causes the two indicators to rise together. 3) Tests across states in 1961 provide no evidence that the reported number of opiate users is lower, other things being equal, in states with a high probability of punishment for major crimes generally. The interstate comparisons rely on the probability of punishment for all offenses rather than drug offenses alone.

Aggregate data do not clearly distinguish between enforcement against users and enforcement against distributors. This distinction is of course blurred because many users are small distributors. In an analysis of individual behavior, Bachman and Witte (Chapter 7) examine a sample of male North Carolina prisoners following release. Bachman and Witte use the individual's length of sentence as a measure of his expected penalty for further crime. They find that a greater length of sentence is associated with fewer post-release arrests for both ex-addicts and others. However, perverse effects are found when the strength of deterrence was measured by the individual's expected probability of arrest and conviction.

Supervision is found to decrease the frequency of post-release arrest. Parole appears to be particularly effective in deterring ex-addicts, in comparison with alcoholics and other offenders. A related issue is the question of the role of compulsion in the success of treatment programs. The New York State program of involuntary incarceration was unsuccessful because of high cost, high abscondance rates, and high recidivism (Chapter 9). However, compulsion may be an important element when properly used. The strong effects of surveillance in a post-prison release population found by Bachman and Witte are not the only evidence pointing in this direction. The Washington, D.C. court diversion program showed gains when persons were continuously monitored after being

referred to treatment. Sheffet et al. (1975) found much higher retention rates in a therapeutic community in the face of legal pressure.

Bachman and Witte provide an interesting test of the effects of income maintenance. They find that prisoners who were able to accumulate the greatest amount of work release earnings had the greatest likelihood of rearrest after release from prison, presumably as a result of more rapid return to drugs. However, the analysis also suggests that the adverse effects did not occur when surveillance was also provided.

Most evidence relates to persons who have been using drugs for some time. However, there is reason to believe the effects of deterrence are much greater for new or potential users than others. The tendency for drugs to be distributed free to encourage first use is one indication that making use less costly has a relatively large impact (Moore, 1973). Another indication is the relatively greater contagion effects for new users found by Hunt and Chambers (1976). Other indications come from evidence of strong responsiveness of youth to incentive factors in studies of migration and labor market behavior. The material in Chapter 6 is not inconsistent with this interpretation.

Chapters 8 through 10 deal with the effectiveness of education, treatment and supportive service programs. If young persons respond more readily to various stimuli, a properly designed drug education program might be expected to have a large effect. Grizzle's examination of the effects of a program in Charlotte, North Carolina between 1972 and 1974 is reported in Chapter 8. Behavior of approximately 24,000 students in 14 "experimental" and 12 "non-experimental" schools is compared to determine the impact of the program on usage of a variety of drugs, on drug knowledge and on the percentage of students in high-risk psychological states. Grizzle finds important effects of drug education on usage for the program studied.

There has been increasing concern that when drug education programs raise student interest and provide greater knowledge of drugs they tend to increase rather than decrease drug use (Wald et al., 1972). Grizzle finds no evidence to support this view, but she also notes that the program emphasis changed when the possibility of such effects became a matter of concern.

Education is particularly difficult to evaluate because the content and quality of programs can vary enormously. The careful efforts of this study provide confidence in the findings for this program but leave uncertain how much the results can be generalized.

While a variety of treatment methods have evolved to deal with the problem of drug abuse, knowledge of the effectiveness of alternative treatments remain limited. The need to vary treatments with circumstances creates demands for information not only on details such as dosage responses but also on broad issues of the appropriateness of treatment approaches for different population groups. Where experimental variation is not possible it becomes necessary to use

statistical techniques to infer what would happen if treatments varied. Leveson (Chapter 9) considers the problem of matching treatments and patients based on aggregate data.

A central part of the analysis consists of an examination of the "maturation hypothesis" which states that addicts tend to mature out of addiction after a period of years. The age distributions of persons reported to the New York City Narcotics Register, together with assumptions about maturation, imply a pattern of growth of addiction in the past. The age distributions are found to be consistent with some form of maturation since, if maturation did not occur, unreasonable patterns of growth of addiction over time would be implied.

Because of maturing out of addiction, the length of time a person can be expected to continue abusing drugs varies with age. Differences among persons of different ages in the remaining number of years of addiction must be taken into account in calculating benefits of treatment programs.[3] The approach suggests, for example, that it might be beneficial for methadone programs to admit persons below age 20 even though the retention rates are low, since the benefits would be collected for a longer period than for older persons.

To date, the most significant attempt to provide employment for former drug abusers, together with treatment and other services, is the Wildcat program in New York City. The evaluation of that program, which is summarized in Chapter 10, led to the expansion of supported employment on a national scale. Friedman (Chapter 10) finds that the benefits do exceed the costs, but not dramatically. Furthermore, it was exceedingly difficult to identify which persons would have done well without supported employment. The study also found that there were important benefits in reduced public assistance payments and that female former abusers had greater problems in finding and holding jobs than males.

When I first became interested in drug abuse research in 1967, I was impressed most by the dogmatism of many discussions of drug abuse policy and of the absence of processes to assure objective research. Since that time, work in the field has come a long way. The contributions to this volume illustrate only a part of the growing literature which is both making the criteria for policy decisions explicit and providing a factual foundation on which intelligent choices can be based.

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[3]Application of the suggested measure of effectiveness to an extensive set of comparisons among policies and programs can be found in Leslie (1976). This approach was also reached by Grizzle in Chapter 8.

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Contents

CHAPTER 1

Costs of Drug Abuse to Society

BRENT L. RUFENER
J. VALLEY RACHAL
ALVIN M. CRUZE

This chapter provides an estimate of the total economic costs experienced by society in the 1975 fiscal year due to the abuse of drugs. These costs have been developed from existing secondary data sources and from the latest research findings concerning the extent of drug abuse in the United States and the association between drug abuse and other forms of behavior that impose costs to society. In addition, the results of this study build on previous efforts to estimate these costs, most notably studies by A.D. Little (1974) and Johns Hopkins (Lemkau et al., 1975).

This study does not purport to be the definitive answer regarding the economic costs to society of drug abuse. In some cases it was necessary to use data of questionable reliability where nothing better was available. In other cases it was necessary to use data from small, limited studies to estimate totals for the entire United States. For some cost components, too little is known about the related behavioral phenomena to provide definitive conclusions regarding the impact of drug abuse. For example, the amount of nondrug criminal activity "caused" by drug abuse is an important question about which definite answers are not yet available. Subject to the qualifications given, we feel, however, that this study presents a useful national estimate of the economic costs to society of drug abuse in fiscal year 1975.